## CLAIMS

•		~	•			
1.	А	fluidics	station.	com	prisin	o:
• •	4 1	Halalos	Julion,	COILL	P****	ъ,

a housing constructed and arranged to accept one or more removable modules,

5 wherein each of the one or more removable modules comprises:

a holder constructed and arranged to receive a probe array cartridge, wherein the probe array cartridge includes a chamber fluidically coupled to a plurality of apertures;

a transport mechanism constructed and arranged to reversibly transport the holder and the probe array cartridge between a first position and a second position;

one or more alignment pins constructed and arranged to engage one or more alignment features of the probe array cartridge, wherein the probe array cartridge is in the second position; and

a needle constructed and arranged to interface with each of the plurality of apertures.

2. The station of claim 1, wherein: the housing accepts up to 4 of the modules.

3. The station of claim 1, wherein:

the holder receives the probe array in a specific orientation.

4. The station of claim 3, wherein:

25 the specific orientation is defined by an alignment tab associated with the probe array cartridge and an alignment groove associated with the holder.

5. The station of claim 1, wherein:

the chamber houses a biological probe array enabled to detect biological

30 molecules.

10

15

20

6.	The station of claim 1, wherein:
	the transport mechanism transports the holder and probe array cartridge along a
linear	axis.

- 5 7. The station of claim 1, wherein:
  the one or more alignment pins precisely position the probe array cartridge.
  - 8. The station of claim 1, wherein:
    the needle introduces and removes fluid from the probe array cartridge.

9. The station of claim 1, wherein:
at least two needles interfacing with the plurality of apertures are further constructed and arranged for fluid detection.

15 10. The station of claim 9, wherein: the fluid detection includes conductivity measurements.

10

20

- 11. The station of claim 9, wherein:the fluid detection includes the presence or absence of a fluid.
- 12. The station of claim 9, wherein:
  the fluid detection includes the identity of a fluid.
- The station of claim 1, wherein each module further comprises:
   a vial holder constructed and arranged to hold a plurality of vials; and
   a leaf spring mechanism associated with each of the plurality of vials constructed
   and arranged to reversibly position a vial needle in the bottom of the vial.
- 14. The station of claim 13, wherein:30 each of the plurality of vials holds a fluid.

the vial needle removes the fluid from the vial for transfer to the probe array cartridge.

5 16. A method for fluid transfer, comprising the acts of:

accepting one or more removable modules, wherein each of the one or more removable modules performs the acts of:

receiving a probe array cartridge, wherein the probe array cartridge includes a chamber fluidically coupled to a plurality of apertures; reversibly transporting the holder and the probe array cartridge between a first position and a second position;

engaging one or more alignment features of the probe array cartridge, wherein the probe array cartridge is in the second position; and interfacing with each of the plurality of apertures.

15

20

10

- 17. The method of claim 16, wherein: the housing accepts up to 4 of the modules.
- 18. The method of claim 16, wherein:
  the holder receives the probe array in a specific orientation.
- 19. The method of claim 18, wherein:

the specific orientation is defined by an alignment tab associated with the probe array cartridge and an alignment groove associated with the holder.

25

20. The method of claim 16, wherein:

the chamber houses a biological probe array enabled to detect biological molecules.

30 21. The method of claim 16, wherein:

the act of reversibly transporting includes transporting along a linear axis.

22. The method of claim 16, wherein each removable module further performs the acts of:

detecting fluid via the interface with at least two of the plurality of apertures.

5

- 23. The method of claim 22, wherein:
  the act of detecting fluid includes conductivity measurements.
- The method of claim 22, wherein:
  the act of detecting fluid includes detecting the presence or absence of a fluid.
  - 25. The method of claim 22, wherein:
    the act of detecting fluid includes detecting the identity of a fluid.
- 15 26. The method of claim 16, wherein each removable module further performs the acts of:

holding a plurality of vials; and reversibly positioning a vial needle in the bottom of each vial.

- 20 27. The method of claim 26, wherein: each of the plurality of vials holds a fluid.
  - 28. The method of claim 27, further comprising the act of: removing the fluid from the vial for transfer to the probe array cartridge.

25

30

29. A fluidics module, comprising:

a holder constructed and arranged to receive a probe array cartridge, wherein the probe array cartridge includes a chamber fluidically coupled to a plurality of apertures;

a transport mechanism constructed and arranged to reversibly transport the holder and the probe array cartridge between a first position and a second position; one or more alignment pins constructed and arranged to engage one or more alignment features of the probe array cartridge, wherein the probe array cartridge is in the second position; and

a needle constructed and arranged to interface with each of the plurality of apertures.

30. The module of claim 29, wherein:

5

10

20

25

- the fluidics module is further constructed and arranged to interface with a housing, wherein the housing accepts up to 4 of the fluidics modules.
- 31. The module of claim 29, wherein:
  the holder receives the probe array in a specific orientation.
- 32. The module of claim 31, wherein:
- the specific orientation is defined by an alignment tab associated with the probe array cartridge and an alignment groove associated with the holder.
  - 33. The module of claim 29, wherein:
    the chamber houses a biological probe array enabled to detect biological molecules.
  - 34. The module of claim 29, wherein:

the transport mechanism transports the holder and probe array cartridge along a linear axis.

- 35. The module of claim 29, wherein:
  the one or more alignment pins precisely position the probe array cartridge.
- The module of claim 29, wherein:
  the needle introduces and removes fluid from the probe array cartridge.

37.	The module of claim 29, wherein:
	at least two needles interfacing with the plurality of apertures are further
constri	acted and arranged for fluid detection.

- 5 38. The module of claim 37, wherein: the fluid detection includes conductivity measurements.
  - 39. The module of claim 37, wherein:
    the fluid detection includes the presence or absence of a fluid.
  - 40. The module of claim 37, wherein: the fluid detection includes the identity of a fluid.

10

25

- 41. The module of claim 29, wherein each module further comprises:

  a vial holder constructed and arranged to hold a plurality of vials; and
  a leaf spring mechanism associated with each of the plurality of vials constructed
  and arranged to reversibly position a vial needle in the bottom of the vial.
- 42. The module of claim 41, wherein:20 each of the plurality of vials holds a fluid.
  - 43. The module of claim 42, wherein:
    the vial needle removes the fluid from the vial for transfer to the probe array cartridge.
  - 44. A computer system having system memory with control software stored thereon, wherein the control software performs methods of instrument control comprising the acts of:
- receiving a probe array cartridge, wherein the probe array cartridge includes a chamber fluidically coupled to a plurality of apertures;

reversibly transporting the holder and probe array cartridge between a first position and a second position, wherein the act of reversibly transporting includes transporting along a linear axis;

engaging one or more alignment features of the probe array cartridge, wherein the probe array cartridge is in the second position; and

interfacing with each of the plurality of apertures.